Cyberbullying: Reciprocal links with Social Anxiety, Self-Esteem and Resilience in U.K. school children.

Megan L Burns

1202534

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Department of Psychology, University of Chester, U.K.

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Declaration

This work is original and has not been submitted in relation to any other degree or qualification.

Signed:

Date:

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Supervisor Meeting Log 2016/2017

Student: Megan Burns

Supervisor: Professor M. Boulton

Date	Discussion Topics	Action Agreed
1st March 2017	Discussed initial ideas. Agreed to carry out group project. Project will surround victimisation/bullying and social relationships in children (10-16), using questionnaires to collect data.	Think about specific constructs to assess and possible schools to contact.
8th March 2017	Developed a list of possible constructs relating to traditional and online bullying. Discussed measures and how to keep the overall questionnaire a suitable length.	Find suitable measures for the constructs to be included in the questionnaire.
15th March 2017	Shared and selected measures for questionnaire and set up group access to Bristol Online Surveys. Discussed application for ethical approval	Upload items for questionnaire onto Bristol Online Surveys, begin ethics form and begin literature review.
22nd March 2017	Group meeting to discuss application for ethical approval.	Complete individual application for ethical approval and continue literature review.
5th April 2017	Reviewed application for ethical approval and discussed minor amendments prior to submission.	Submit application for ethical approval and continue literature review.
10th May 2017	Discussed reviewer's comments/recommendations on application for ethical approval, outlined how to respond to suggestions.	Complete ethical amendment form.
24th May 2017	Ethical approval now obtained, data collection can begin.	Begin data collection.
21st June 2017	Arranged group meeting for once data collection has been completed.	Continue data collection in school.
12th July 2017	Group meeting to discuss data analysis, individual research question(s) and dissertation write-up.	Prepare full draft of dissertation.
20th September 2017	Draft feedback – areas to improve.	Make improvements and amendments in final draft.

Student Signature: Date:

Supervisor Signature: Date:

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Abstract

During childhood and adolescence, many challenges are faced, each with the potential for adverse psychological, social and educational outcomes. However, one of the greatest concerns for school aged children continues to be bullying, which is constantly changing due to the development of modern technology, and the subsequent growth of cyberbullying. As cyberbullying is a relatively novel construct within psychological literature, there is a considerable lack of explorative research, particularly surrounding the potential impacts of cyberbullying. Thus, the present study intended to address several gaps in the existing literature, by working towards a more functional explanation of the relationship between cyberbullying and social anxiety, specifically in U.K. adolescents. Additionally, the role of self-esteem and resilience have been explored in terms of their protective benefits. Based upon a sample of 653 school children, aged 10-16 years, simple and hierarchical multiple regression revealed a potentially reciprocal relationship between cyberbullying and social anxiety. Results also revealed cyberbullying, self-esteem and resilience to uniquely predict social anxiety, and social anxiety and self-esteem to uniquely predict cyberbullying. Gender differences in cyberbullying, self-esteem and resilience were also reported. Taken together, the findings provide information that may be crucial in understanding, preventing and intervening in cyberbullying to limit adverse outcomes.

Cyberbullying: Reciprocal links with Social Anxiety, Self-Esteem and Resilience in U.K. school children.

Of all major health concerns for school aged children, bullying continues to be one of the most profound and pervasive causes for concern (Juvonen, Graham & Schuster, 2003; McDougall & Vaillancourt, 2015; Nansel et al., 2001). Childhood bullying has consistently been associated with negative psychological, social and developmental outcomes, with bullied children and adolescents showing significant increases in internalising disorders, such as anxiety and depression, as well as decreased school engagement and social functioning (Hawker & Boulton, 2000; Ladd, Ettekal & Kochenderfer-Ladd, 2017; McDougall & Vaillancourt, 2015; Nakamoto & Schwartz, 2010). However, despite over 20 years of research, there continues to be discrepancies, gaps, and methodological issues within the field, providing clear justification for the continued efforts to further understand the causes, consequences and correlates of bullying (Olweus, 2013).

Thus, to work towards a comprehensive and consistent field of research, the present study intends to explore the following current issues; the reciprocal relationship of cyberbullying and social anxiety in adolescence, the role of self-esteem and resilience as protective factors, potential gender differences in cyberbullying, social anxiety, self-esteem and resilience, and the psychometric qualities of the proposed measures. Each issue will be discussed in turn, beginning with a general background to bullying in childhood and adolescence before moving on to more specific and complex issues.

Bullying in Childhood and Adolescence

Whilst there are no official statistics for the prevalence of bullying in the United Kingdom, it is estimated that over 16,000 children between the ages of 11-16 were consistently absent from school, and over 24,000 sought advice or counselling due to bullying in 2016/17 (Bentley et al., 2017; Brown, Clery & Ferguson, 2011; NSPCC, 2017). Although it is considered common for most children and adolescents to experience periods of increased peer conflict, and is often considered necessary in the development of social and relational skills, the children who experience prolonged, chronic and significant peer conflict are at significant risk (Menesini & Salmivalli, 2017; Nansel et al., 2001; Smith & Brain, 2000). Although specific definitions of bullying vary, those most commonly cited involve intentionally harmful or aggressive behaviour that is repeated or chronic in nature, with an imbalance of power between perpetrator and victim (Olweus, 1999; Olweus, 2013; Solberg & Olweus, 2003; Smith & Brain, 2000). Throughout the existing literature, the terms bullying, peer victimisation, and peer aggression are often used interchangeably and synonymously, and for the purposes of this work will all be referred to as bullying. Bullying behaviours take a variety of forms, including verbal, physical or emotional, and may be motivated by a range of factors (Hymel & Swearer, 2015; Nansel et al., 2001). However, they have traditionally been discussed in two distinct categories; overt and relational bullying (Prinstein, Boergers & Vernberg, 2001). Overt bullying refers to the direct or physical acts of aggression most commonly associated with bullying, such as hitting, kicking and pushing, whereas relational bullying is more indirect, subtle, and involves causing harm to another's social status or reputation, in ways such as social exclusion or spreading rumours (Prinstein et al., 2001; Putallaz et al., 2007).

Despite some methodological inconsistencies in the bullying literature, there is a clear and consistent finding, linking experiences of childhood and adolescent bullying to long-term adverse psychosocial outcomes such as depression, anxiety, aggression and substance misuse (Dempsey & Storch, 2008; McDougall & Vaillancourt, 2015; Smith & Brain, 2000). In a meta-analysis of 18 longitudinal studies involving 13,978 children and adolescents, bullying was a consistent and significant predictor of increases in both depression and anxiety (Reijntjes, Kamphuis, Prinzie & Telch, 2010). Despite such findings highlighting the intense relationship between bullying and internalising disorders, most of the studies reviewed focused on children in middle childhood (7-12 years), with only two of the 18 studies involving children over the age of 12. Thus, it is unclear to what extent these findings may translate to older children or adolescents. Nevertheless, more recent findings suggest a considerable long-term impact of childhood bullying, with those bullied during middle childhood showing heightened risk for internalising disorders at a 10-11 year follow up (Schwartz, Lansford, Dodge, Pettit & Bates, 2015). Thus, the impacts of childhood bullying are well documented, and have the potential for severe clinical implications throughout the lifespan (Smith & Brain, 2000).

The potential impacts of bullying can be understood in terms of the need to belong theory; that of all the basic human needs, the need to belong and feel accepted by others is one of the most crucial, and failure to achieve a sense of belonging can have considerable negative impact on psychological adjustment (Baumeister & Leary, 1995). As those who are repeatedly bullied are less likely to maintain satisfying social relationships, they are at increased risk of failing to achieve a sense of belonging, and therefore may experience psychological malfunction. Findings demonstrate that increased school connectedness and belonging predicts greater psychological

adjustment and academic attainment, lending support to the postulates of need to belong theory, as those who are bullied are likely to feel less like they belong, increasing their risk of psychological maladjustment (Scarf et al., 2016; Turner, Reynolds, Lee, Subasic & Bromhead, 2014). Additionally, as the types of victimisation associated with sense of belonging, such as social exclusion have emerged as greater longitudinal predictors of psychological malfunction than overt or verbal bullying, it is plausible that detriment to sense of belonging may precede such outcomes (Boulton, 2013).

A clear pattern has been observed within the literature, with frequency of bullying increasing around middle childhood and early adolescence before decreasing in later adolescence (Hymel & Swearer, 2015). During adolescence, peer relationships become central in development as it is a time of increased autonomy and major transitions, such as the move to secondary school, whereby bullying is likely to be more detrimental than at other ages (Lester, Cross, Dooley & Shaw, 2013; Prinstein et al., 2001; Troop-Gordon, 2017). Bullying during adolescence is therefore likely to present entirely unique causes, consequences and correlates to other developmental stages (Troop-Gordon, 2017). For example, much of the literature regarding adolescence observes a heightened amount of bullying surrounding sexuality, due to the increased focus on intimate relationships, with 57% of sexual minority adolescents reporting extensive and chronic bullying, demonstrating a clear issue that is unlikely a factor for younger children (Collins, 2003; Menesini & Salmivalli, 2017; Robinson, Espelage & Rivers, 2013; Troop-Gordon, 2017). Despite the unique experience of adolescence, however, there is a lack of research empirically examining the experience of bullying within this specific age group, as most large-scale studies include participants across a wide age range (Troop-Gordon, 2017). Thus, there is a clear

need for specific attention to be paid to bullying in adolescence, due to the unique complexity of this population.

Cyberbullying: A New Phenomenon with Unique Effects?

Considering the vast array of research literature, and the frequent emphasis in policy and practice, teachers, parents and children themselves have a clear understanding and awareness of bullying in schools and the impacts it may have (McDougall & Vaillancourt, 2015). However, with recent technological advancements and the ever-growing availability of computers, the internet and social media, a new phenomenon has emerged; cyberbullying. The number of children using the internet, and the ways in which connectivity is being used have seen considerable shifts, with children and adolescents spending increasing amounts of time online (E.U. Kids Online, 2014; OFCOM, 2016). According to the 2016 children's media usage report, weekly internet usage now exceeds television consumption for the first time, demonstrating clear changes in trends, and the ever-growing role of the internet (OFCOM, 2016). Additionally, 79% of 12-15 year olds now own their own smartphone, giving children quick, easy, and constant access to online communication (OFCOM, 2016). A recent study of 11-15 year olds highlighted the overwhelming role of digital technology in young people's lives, with many participants unable to imagine a life without the internet (Betts & Spenser, 2017). Whilst there are clear benefits to such dynamic technology, such as instant access to information and maintaining social contact with friends, there are also considerable risks attached, unique to modern technology (Betts & Spenser, 2017; Kowalski et al., 2014; Valkenburg & Peter, 2011; Wu, Outley, Matarrita-Cascante & Murphrey, 2016).

Over recent years, cyberbullying has come to the forefront of research, with reports of high prevalence and severe implications sparking increased attention, particularly within the media (Hase et al., 2015; Olweus & Limber, 2017; Whittaker & Kowalski, 2015). However, the rapidly developing nature of the online environment has presented several challenges in the ability to clearly define and conceptualise cyberbullying as a unique set of behaviours (Canty, Stubbe, Steers & Collings, 2016; Patchin & Hinduja, 2015; Wingate, Minney & Guadagno, 2013). However, the social challenges faced online are said to closely reflect the 'real life' challenges faced by adolescents, making it possible to apply traditional bullying definitions (Dempsey et al., 2009). Thus, it is plausible to define cyberbullying as bullying that takes place through an online domain, with a degree of intent, repetition and power imbalance, as the frequency of cyberbullying appears to have the same impact as traditional bullying (Olweus, 2013; Patchin & Hinduja, 2015; Whittaker & Kowalski, 2015). Additionally, it is proposed that in the context of cyberbullying, power imbalance can be understood as differences in digital knowledge, social status or the possession of potentially harmful material, such as humiliating photos or messages (Olweus, 2013; Patchin & Hinduja, 2015).

Whilst cyberbullying has seen a dramatic increase in interest, the prevalence remains unclear, with estimates varying widely due to inconsistent conceptualisation and measures (Olweus, 2013; Olweus & Limber, 2017). A large sample study of 17 schools and over 16,000 students across four time intervals between 2006 and 2012 found an alarming rise in self-reports of cyberbullying, from 15% to 21% (Schneider, O'Donnell & Smith, 2015). Additionally, a decrease in instances of traditional bullying was observed, demonstrating a clear shift in the trends of bullying, and highlighting the current role of cyberbullying. However, whilst the sample was large, all schools had been subject to new anti-bullying legislation in 2010, potentially influencing the shift away from

traditional bullying to cyberbullying, which typically takes place away from school (Schneider et al., 2015). Additionally, between 2008 and 2010 the cyberbullying survey was modified to include 'spreading rumours', potentially explaining the increase in reports of cyberbullying, and highlighting the need for a consistent approach in yielding generalizable results (Schneider et al., 2015). However, it has been argued that cyberbullying may not be as prevalent as often assumed, and acts as an extension to traditional bullying rather than creating new victims, as many studies report the prevalence of cyberbullying to match that of traditional bullying (Livingstone & Smith, 2014; Olweus, 2012; Hase et al., 2015). Such findings also imply that the increase in online communication has provided an additional avenue for victims to be targeted simultaneously, as opposed to more children being bullied (Beran & Li, 2005).

However, in a study of 399 adolescents with a mean age of 14.2 years, cyberbullying made a significant unique contribution to depression and suicidal ideation when experience of traditional bullying was controlled for, demonstrating the potential for cyberbullying to significantly impact psychological adjustment, independently of traditional bullying (Bonanno & Hymel, 2013). Due to the nature of online communication, cyberbullying can take place anywhere, including the victims' own home. This has been said to intensify the experience and make it appear worse than traditional bullying, along with the increased anonymity of online communications, which also contributes to the increased severity of cyberbullying (Bonanno & Hymel, 2013; Sticca & Perren, 2013; Wingate et al., 2013). Thus, evidence suggests that cyberbullying should be assessed as an independent construct, particularly considering the changes in trends around online technology. However, some of the reported effect sizes are small, demonstrating considerable overlap between traditional and cyberbullying (Bonanno & Hymel, 2013; Sticca & Perren, 2013). The high degree of

overlap between traditional and cyberbullying supports the role of cyberbullying as an extension of traditional bullying, and it remains unclear which precedes the other (Hase et al., 2015). However, exploratory factor analysis has revealed that cyberbullying can be viewed both as a unique phenomenon, as well as in conjunction to traditional bullying, suggesting that whilst cyberbullying may act as an extension to traditional bullying, it may also elicit new victims (Randa, Nobles & Reyns, 2015).

Despite the evidence that cyberbullying relates to several adverse psychological outcomes, such as depression, anxiety, and suicide, a 2014 review of young people's use of online technology indicated little or no risk, with cyberbullying typically affecting fewer than one in five adolescents (Livingstone & Smith, 2014; Wingate et al., 2013). Whilst the risks for young people were not found to be rising, significant variance between studies was reported, due to factors such as definition and conceptualization, and the target age groups used (Livingstone & Smith, 2014). Additionally, studies published as early as 2005 were reviewed, and therefore may not provide an accurate representation of the current situation in online risk due to the vast developments in technology over recent years. Research around traditional bullying also indicates differences in the tendency to report instances of victimisation depending on the type of incident, with overt victimisation more often reported than relational (Unnever & Cornell, 2004). Thus, it is possible that online victimisation may be under-reported for several reasons, such as the perception that it is not severe enough to warrant help seeking, which may have implications in the research literature. However, when additional factors such as chronicity have been controlled for, findings suggest no significant difference in reporting behaviours between types of victimisation, suggesting that differences may be influenced by wider factors, such as chronicity and school culture (Unnever & Cornell, 2004).

Although the cyberbullying literature has expanded considerably in recent years, due to the relative newness of the research interest much of the literature is descriptive in nature, focusing on attempts to establish cyberbullying prevalence rates (McCuddy & Esbensen, 2016; Olweus, 2012; Patchin & Hinduja, 2010). Research moving beyond such description has also relied on small samples in singular locations, limiting the ability to compare and generalise findings beyond the individual sample populations (McCuddy & Esbensen, 2016). Additionally, the impact of cyberbullying remains unclear, with conflicting reports regarding the unique impact of cyberbullying and variance in measurements and sample characteristics (Beran et al., 2015; Hase et al., 2015). Thus, the rationale for attempting to establish a more functional understanding of the processes involved in cyberbullying and potential negative outcomes is clear, along with the need for a specific focus on cyberbullying as its' own entity. Thus, the present study intends to expand the cyberbullying literature, by moving away from attempts to establish prevalence, and begin to shed light on the specific factors that are likely associated with cyberbullying, particularly social anxiety, self-esteem and resilience.

Reciprocal Relationship between Cyberbullying and Social Anxiety

One commonly observed correlate of both traditional and cyberbullying is social anxiety disorder (SAD), the most prevalent of all anxiety disorders in the developed western population (NICE, 2013). However, the associations between social anxiety and cyberbullying are much less clear than those between social anxiety and traditional bullying. As defined by the DSM 5, SAD, or 'social phobia' is characterised by an intense, disproportionate, and persistent fear of social situations (American Psychiatric Association, 2013; NICE, 2013). SAD causes significant impairment to social

functioning, with individuals' often avoiding social situations or experiencing severe fear beyond typical 'shyness' (NICE, 2013). Not only is SAD chronic in nature, there is also a high comorbidity with other disorders, such as depression and substance misuse, demonstrating the severe and long-term clinical implications (Buckner et al., 2008; Ohayon & Schatzberg, 2010; Ollendick & Hirshfeld-Becker, 2002). 75% of social anxiety disorders manifest between the ages of 8 and 15, with an average onset age of 13, often attributed to the increased focus on peer relationships during adolescence (APA, 2013; Ollendick & Hirshfeld-Becker, 2002; Spence & Rapee, 2016). Adults with SAD are likely to avoid anxiety provoking situations, which presents challenges for youth who may be unable to avoid such situations, including school, which can have severe educational consequences, such as school refusal and lower academic success (Ollendick & Hirshfeld-Becker, 2002).

A consistent body of research exists to support the association between traditional bullying and increases in signs of social anxiety, such as fear of negative evaluation and social avoidance (La Greca & Moore Harrison, 2005; Leary, 1990; Storch, Brassard & Masia-Warner, 2003). Such profound impacts of child and adolescent bullying may be short term, but evidence has also documented a longitudinal risk, with those bullied during childhood reporting greater social anxiety in adulthood (Boulton, 2013). Thus, given the high overlap between traditional and cyberbullying, it is likely that a similar relationship will exist between cyberbullying and social anxiety, although this is considerably under studied. It has also been argued that specific types of bullying may have varying degrees of influence on social anxiety, such as overt, but not relational bullying being reported to predict increased social anxiety across a one year period (Loukas & Pasch, 2013). However, there is a current lack of research assessing the specific contribution of independent forms of bullying to increases in social anxiety,

providing clear rationale for the proposed study of cyberbullying in relation to social anxiety (Reijntjes et al., 2010; Spence & Rapee, 2016).

Whilst social anxiety has typically been viewed as an outcome of bullying, recent research has challenged this suggestion, implying that the relationship may be more complex and involve multiple developmental pathways (Crawford & Manassis, 2011; McDougall & Vaillancourt, 2015). The idea of a reciprocal relationship between bullying and social anxiety can be explained in terms of the transactional model, in which development is said to result from continuous interactions of individual, contextual and environmental factors (Boulton, Smith & Cowie, 2010; Sameroff, 2009). For example, a study of 1956 children and adolescents, found social withdrawal to predict subsequent bullying when mediated by rejection, suggesting that behaviours related to social anxiety may influence the wider social context and environment (Hanish & Guerra, 2000). However, this finding was limited to children aged nine and ten years and did not extend to all ages involved in the study. A study of 228 adolescents over two months, however, found social anxiety to act as both a consequence and an antecedent of bullying, with a clear multi-directional relationship (Siegel, La Greca & Harrison, 2009). The effect appeared stronger for relational victimisation, the type of bullying most often seen online, suggesting that a multi-directional relationship between cyberbullying and social anxiety may also emerge (Siegel et al., 2009). However, a recent longitudinal study of 2128 adolescents found social anxiety to make a significant contribution to later cyberbullying, but previous cyberbullying was not predictive of subsequent social anxiety (Pabian & Vandebosch, 2016). Thus, it was concluded that social anxiety may increase the likelihood of future victimization, but cyberbullying may not predict social anxiety. However, whilst the contribution of social anxiety was

significant, the effect size was considered fairly small and requires further investigation (Pabian & Vandebosch, 2016).

It has also been proposed that this reciprocal relationship may be due to the specific behaviours typical of socially anxious individuals, such as social withdrawal, avoidance and isolation, which may increase vulnerability to bullying (Spence & Rapee, 2016). For example, a study of 1127 10 to 12 year old children found the fear of negative evaluation associated with social anxiety to be a significant predictor of cyberbullying, along with lack of social competence and difficulties in communicating with peers (Navarro, Yubero, Larrañaga & Martínez, 2012). However, as is the case with many studies within this field, the ability to generalise findings is restricted, due to the narrow age range of participants and a solely Spanish sample. In a meta-analysis of 153 studies, social competence was also found to be a significant unique predictor of bullying, with those who demonstrate difficulties in forming and maintaining successful social relationships at considerable risk of bullying (Cook et al., 2010). Such findings again indicate that behaviours, and possible coping mechanisms of socially anxious individuals may increase their risk of bullying. Additionally, factors that appear to protect against vulnerability to bullying, such as the ability to form and maintain friendships, number of friends and quality of friendships are all likely to be implicated in socially anxious children, further increasing their risk to bullying, particularly during the transition to secondary school (Lester et al., 2013).

Whilst the associations between social anxiety and bullying appear fairly consistent, findings also indicate that this intensifies during adolescence, possibly due to anxious individuals appearing vulnerable during a stage of increased pressure to demonstrate popularity, and thus become targeted (Troop-Gordon, 2017). This may be significant

during adolescence due to the considerable social changes that take place with the transition to secondary education and the reforming of social groups, which may present severe challenges to socially anxious individuals (Troop-Gordon, 2017). However, many of the studies linking bullying and psychological outcomes consider a broad range of developmental stages, with few studies focusing specifically on adolescent development (Troop-Gordon, 2017). There has also been a recent call for studies to assess such relationships in explicit age groups and developmental stages, as it is currently difficult to conduct meta-analyses of the differences across the lifespan due to a lack of specific data (Troop-Gordon, 2017).

Additionally, in a study looking specifically at cyberbullying and controlling for experiences of traditional bullying, only depressive symptoms could be predicted by cyberbullying, with social anxiety only associated to relational bullying in the traditional context (Landoll et al., 2015). Thus, the extent to which the associations between traditional bullying and social anxiety translate to cyberbullying remains unclear. Considering the severe personal, social and educational implications of social anxiety, particularly during adolescence, the need to further understand the potential causes and consequences is clearly justified, given the current discrepancies and gaps in existing research. It is also crucial to establish a more functional understanding of the association between cyberbullying and social anxiety, due to the primarily descriptive nature of the existing cyberbullying literature, thus, the potentially reciprocal relationship will be explored.

Self-esteem and Resilience as Protective Factors

As not all those exposed to bullying experience psychological maladjustment, several protective factors have been identified as possible explanations of the variance in

outcomes to both traditional and cyberbullying. For example, parental warmth, social support, and school connectedness, have repeatedly been found to moderate the negative effects of bullying (Borowsky, Taliaferro & McMorris, 2013; Bowes et al., 2010; Greeff & Van den Berg, 2013; Holt & Espelage, 2007; Machmutow, Perren, Sticca & Alsaker, 2012). However, two protective factors consistently and cross-culturally associated with bullying are self-esteem and resilience, both of which are found to protect against adverse psychosocial outcomes, including depression, suicide and risk taking (Ames, Rawana, Gentile & Morgan, 2015; Jackman & MacPhee, 2015; Sharaf, Thompson & Walsh, 2009). Self-esteem is defined as an individuals' perception of their own value and worth, and has consistently been discussed as one of the most crucial predictors of psychological, social and educational problems during adolescence (Greenberg et al., 1991; Orth, Robins, Widaman & Conger, 2014). Resilience, however, refers to the ability to excel and achieve success regardless of significant trauma or adversity, with resilience theory focusing on understanding successful development when significant risks are present (Fergus & Zimmerman, 2005; Luther, Cicchetti & Becker, 2000; Rutter, 1999).

The existing literature demonstrates a consistent correlation between bullying and self-esteem, with those exposed to greater frequencies of bullying showing lower levels of self-esteem (Andreou, 2000; Tsaousis, 2016). Higher levels of self-esteem prior to negative events, such as bullying, are also likely to influence the way a victim adjusts, suggesting that self-esteem may be a crucial protective factor in the relationship between bullying and adverse outcomes (Tetzner, Becker & Baument, 2016). However, it has also been suggested that low self-esteem may precede instances of bullying, as factors including self-esteem, loneliness and empathy have been found to predict cyberbullying, with self-esteem emerging as a significant unique predictor (Brewer &

Kerslake, 2015). However, as participant recruitment took place in further education settings, with participants aged 16-18 years, these particular findings are limited to older adolescents and may not generalise to those of school age (Brewer & Kerslake, 2015).

The likely multi-directional relationship between self-esteem, bullying and adverse outcomes also reflects the ideas of the transactional model of development, that associations are not linear, and multiple factors constantly influence one another. It is therefore likely that factors such as self-esteem, bullying and social anxiety consistently influence one another (Sameroff, 2009). However, few large-scale empirical studies have explored the relationship between cyberbullying as a unique form of victimisation and self-esteem, within a U.K. adolescent population. One of few studies exploring the relationship between self-esteem and cyberbullying in a sample of 1963 adolescents revealed a moderately significant relationship between experiences of cyberbullying and low self-esteem, beginning to support the specific relationship of cyberbullying and self-esteem (Patchin & Hinduja, 2010). However, these findings do not indicate whether decreased self-esteem is a cause or a consequence of cyberbullying (Patchin & Hinduja, 2010).

In an attempt to explain the function of self-esteem, it has been described by Sociometer Theory as an internal gauge that monitors individuals' levels of interpersonal acceptance in order to reduce or avoid social exclusion (Leary, 2005; Leary & Baumeister, 2000). The complex role of self-esteem in the relationship between bullying and adverse psychological outcomes can be understood in terms of such a theory, as self-esteem has been said to act as a buffer against anxiety. For example, participants given positive personality feedback prior to anxiety-arousing

stimuli demonstrate lower physiological response than those with lower self-esteem (Greenberg et al., 1992). Mediation analysis has also revealed low self-esteem to heighten the relationship between bullying and suicidal ideation in adolescent psychiatric inpatients, reflecting such theory (Jones, Bilge-Johnson, Rabinovitch & Fishel, 2014). Additionally, self-esteem and social self-efficacy appear to moderate the relationship between bullying and academic performance, again supporting the idea that self-esteem may protect against the negative outcomes of bullying (Raskauskas, Rubiano, Offen & Wayland, 2015). Such findings also reflect terror management theory, and the idea that maintenance of high self-esteem serves as a mechanism for protecting against anxiety through feeling secure, safe and accepted (Solomon, Greenberg & Pyszczynski, 1991). Thus, by increasing adolescents' self-esteem, there may be potential to reduce the impacts of bullying on psychosocial outcomes, suggesting useful implications for intervention (Jones et al., 2014; Ybrandt & Armelius, 2010).

Throughout the bullying literature, resilience has also been discussed as a potential explanation of the varying patterns of adjustment in response to bullying and a range of other problem behaviours (Freitas et al., 2017; Ttofi, Bowes, Farrington & Losel, 2014). Resilience can be understood as a range of individual and environmental protective mechanisms, which are likely to moderate and compensate for the impacts of adverse life events (Fergus & Zimmerman, 2005; Freitas et al., 2017; Rutter, 1999). In a longitudinal study of 3136 adolescents, factors such as parent and sibling relationships, social belonging and friendship quality appeared to increase resilience, and protect against depression and future delinquency upon frequent experience of bullying (Sapouna & Wolke, 2013). Resilience in adolescents has also been found to mediate the relationship between bullying and adverse outcomes including low self-efficacy and

depressive symptoms, suggesting that increased resilience protects against negative outcomes through indirect pathways (Narayanan & Betts, 2014; Zhou, Liu, Niu, Sun & Fan, 2017). Thus, considering the large overlap between traditional and cyberbullying, resilience is likely to play a significant role in the relationship between cyberbullying and adverse psychosocial outcomes. To date, however, a lack of research exists surrounding the potential association between resilience and cyberbullying.

Further, considering the contribution that self-esteem makes to resilience, it is likely that factors such as self-esteem, resilience and social anxiety act collectively to contribute to the adverse outcomes of bullying, particularly in cases of long-term outcomes (Arseneault, 2017; Ttofi et al., 2014). Considering the protective effects of self-esteem and resilience, those with low self-esteem and low resilience may be at increased risk of psychological malfunction as a result of bullying. Thus, it may be useful to assess both constructs together within the same sample, as low self-esteem and low resilience are likely to occur simultaneously (Freitas et al., 2017). However, despite a growing interest in protective mechanisms, the existing research lacks detail surrounding the role of resilience in intervention as well as the role of resilience and self-esteem in relation to cyberbullying (Ttofi et al., 2014). Thus, the present study intends to add the existing research by considering the relationship between self-esteem and resilience in relation to cyberbullying and social anxiety, in a U.K. adolescent population, in an attempt to further understand the nature of the relationships.

Gender Differences in Cyberbullying, Social Anxiety, Self-Esteem and Resilience

As the research literature surrounding bullying has developed over the last decade, the role of gender has been identified as an area for future study (Ostrov & Kamper, 2015).

Much of the existing literature points towards a consistent gender pattern in traditional bullying, with boys demonstrating a greater involvement in overt bullying as both victims and perpetrators, whilst relational bullying, such as spreading rumours appears to be more common amongst girls (Hymel & Swearer, 2015; Menesini & Salmivalli, 2017). As cyberbullying is viewed as a form of relational aggression, it is often assumed to be a greater issue for girls than boys, with findings reflecting such a gender difference (Beale & Hall, 2007). However, this view has been challenged by findings that suggest cyberbullying is more common among boys, mirroring the pattern of traditional overt bullying (Erdur-Baker, 2010). However, this particular finding is based upon a Turkish sample, with potential cultural differences to a U.K population, restricting the generalisability of results (Erdur-Baker, 2010).

Additionally, it has been suggested that little difference in the frequency of relational bullying exists between boys and girls, suggesting that a gender difference in cyberbullying may not be evident (Prinstein et al., 2001). Evidence also suggests that adolescent girls demonstrate lower self-esteem and greater psychological distress than age-matched males as a result of cyberbullying (Cenat et al., 2015). Findings also suggest that relational bullying has a much greater impact on girls internalising problems, such as anxiety and low self-esteem than boys, although results are again mixed and inconsistent (Prinstein et al., 2001). However, as the majority of research suggests that girls experience more cyberbullying than boys, girls may be at greater risk of adverse psychological outcomes, including low self-esteem and social anxiety. Thus, whilst a gender difference is expected based upon a considerable proportion of the current literature, whether this exists within cyberbullying remains unclear.

As other psychological disorders show consistent and cross-cultural gender differences, such as depression, with a considerably higher prevalence among women than men, it is possible that similar differences will exist for social anxiety disorder (Rutter, Caspi & Moffitt, 2003; Van de Velde, Bracke & Levecque, 2010). However, despite the vast prevalence of social anxiety disorder, there has been a considerable lack of focus on gender differences, comparative to other psychological disorders, particularly in adolescents, with mixed and inconclusive results (Asher et al., 2017; Rutter et al., 2003). A study of anxiety disorders in adulthood reported no difference in lifetime prevalence of social anxiety disorder between men and women, but observed a higher comorbidity for other anxiety related disorders, major depression and eating disorders in women, suggesting that social anxiety disorder may have more substantial impact upon women throughout the life course (Asher et al., 2017; McLean, Asnaani, Litz & Hofman, 2011). However, some evidence suggests a greater prevalence among adolescent girls than boys, although this may be due to differences in support seeking, with girls more likely to seek help (Ranta et al., 2007; Rutter et al., 2003). It has also been argued that gender differences may vary throughout the lifespan, with boys more susceptible to increased social anxiety than girls around the age of 14, although further research is recommended to support this idea (Ranta et al. 2007). Thus, conclusions are difficult to draw, due to the lack of differentiation between specific types of anxiety disorder and a lack of focus on gender differences, particularly in adolescence (Rutter et al., 2003).

In terms of resilience, evidence of gender differences is also limited, presenting a clear gap in the literature. However, it has been argued that males possess a heightened resilient protective mechanism, often showing greater resilience and less psychological distress in response to illness and natural disasters (Masood, Masud & Mazahir, 2016;

Stratta et al., 2013). For example, data recorded after a severe terrorist attack suggests that women are at increased risk of post-traumatic stress disorder (PTSD) following adverse events, due to lower resilience (Bonanno, Galea, Bucciarelli & Vlahov, 2007). Several recent findings regarding adolescent responses to frequent bullying also report male participants to show greater resilience upon exposure to bullying, implying a potential gender difference (Freitas et al., 2017; Sapouna & Wolke, 2013). However, this has been attributed to the previously discussed gender differences in depression, anxiety, and self-esteem (Freitas et al., 2017). A study of 596 Turkish university students also revealed higher levels of resilience in male participants, although this difference may again reflect cultural differences, as men are viewed as more dominant within this society (Erdogan, Ozdogan & Erdogan, 2015). Biological evidence also indicates a greater heritability rate of resilience in males, based on the findings of twin studies, although inherited resilience is likely influenced by subsequent environmental and developmental factors (Boardman, Blalock & Button, 2008). As self-esteem has often been associated with resilience, it is likely that those with lower self-esteem will also have lower resilience (Freitas et al., 2017). It is therefore possible that adolescent girls will demonstrate lower resilience than boys, which has clear implications for intervention.

The Present Hypotheses

Based on existing research, the present study intends to examine three key hypotheses to develop the current understanding of cyberbullying experiences in U.K. schools, particularly in the adolescent population, and how these experiences can be understood in the context of social anxiety, self-esteem and resilience. Based on the consistent finding that traditional bullying, self-esteem and resilience influence social

anxiety, and the clear overlap between traditional and cyberbullying (Boulton, 2013; La Greca & Harrison, 2005; Leary, 1990; Smith & Brain, 2000; Sowislo & Orth, 2013), hypothesis one predicts that cyberbullying, low self-esteem and low resilience will collectively predict social anxiety. Additionally, considering the importance of exploring the unique contributions of specific variables in understanding causal relationships (Field, 2013; Lindenberger & Potter, 1998), hypothesis 1a predicts that cyberbullying will account for unique variance in social anxiety, hypothesis 1b predicts that self-esteem will account for unique variance in social anxiety, and hypothesis 1c predicts that resilience will account for unique variance in social anxiety.

Secondly, based on the beginnings of research surrounding the potentially reciprocal relationship between cyberbullying and outcomes, such as social anxiety, and the idea that this may act as both a predictor and a consequence of cyberbullying (Navarro et al., 2012; Siegal et al., 2009), hypothesis two predicts that social anxiety, low resilience and low self-esteem will collectively predict increases in cyberbullying. Again, to explore the unique effects of these variables, hypothesis 2a predicts that social anxiety will account for unique variance in cyberbullying, hypothesis 2b predicts that self-esteem will account for unique variance in cyberbullying, and hypothesis 2c predicts that resilience will account for unique variance in cyberbullying.

The third hypothesis refers to gender differences, with previous research suggesting that girls are likely to experience a greater frequency of cyberbullying than boys, due to the relational nature of cyberbullying, as well as girls typically reporting lower levels of self-esteem and resilience (Beale & Hall, 2007; Prinstein et al., 2001). Thus, hypothesis 3a predicts that girls will report a higher frequency of cyberbullying than boys, hypothesis 3b predicts that girls will report lower self-esteem, and hypothesis 3c

predicts that girls will report lower levels of resilience than boys. However, as the literature regarding gender differences in social anxiety is somewhat mixed, hypothesis 3d predicts that there will be a gender difference in social anxiety, although as it is unclear in which direction this difference will be, this hypothesis will remain non-directional.

Psychometric Quality of Measures

The significant variation in findings surrounding bullying and cyberbullying within the literature has frequently been attributed to an inconsistent methodological approach, with a lack of well validated and consistently used measures (Beran et al., 2015; Hymel & Swearer, 2015; Menesini & Salmivalli, 2017; Whittaker & Kowalski, 2015). Given the complex nature of bullying, the research literature relies heavily on the use of self-report measures to capture data that may be problematic or unethical to obtain through experimental procedures (British Psychological Society, 2014; Hymel & Swearer, 2015). However, the use of scales with poor psychometric quality is likely to contribute to an inconsistent and inaccurate field of research, based on flawed data (Hinkin, 1998; Mitchell & Jolley, 2013). Thus, the present study will attempt to address this issue, by establishing the psychometric quality of a range of measures used within the literature. For a measure to be considered 'reliable', it must be repeatable with consistent results, which can be understood through the assessment of internal consistency; the extent to which individual participants' responses to each item correlate with one another. As the reliability of a scale is subject to the specific sample of participants in any case, previously reported reliability estimates should be viewed with caution, with reliability being assessed for each unique sample. All of the measures used within the present study will therefore be assessed for their internal consistency in order to infer reliability

and accuracy of any conclusions drawn. It is intended that by continuing to establish the suitability of the measures used to assess children and adolescents' experiences of cyberbullying, and the potential correlates, a more consistent and universal approach to studying the relatively modern phenomenon of cyberbullying can be formulated, improving the accountability of this interesting and important body of research.

A commonly used measure of internal consistency is the use of Cronbach's Alpha (α), whereby a single value is produced to represent the correlations of each individual item of a scale with one another. Whilst some debate exists around the accepted criterion value to demonstrate internal consistency, the typical recommendation is that scales with a Cronbach's Alpha value exceeding 0.7 are deemed reliable and suitable for use (Pallant, 2013). Additionally, it has been suggested that such values should not exceed 0.9, as this is likely to reflect repetitive and therefore redundant items. Thus, in order to address reliability within the present study, the measures will each be assessed using Cronbach's Alpha measure of internal consistency.

Method

Participants

Participant recruitment took place within six schools across the North-West of England, obtaining an opportunity sample of 653 school children present in the classes attended during data collection. Recruitment took place in accordance with both the British Psychological Society (British Psychological Society, 2014) and the University of Chester ethical guidelines at all times. Prior to participants being recruited, informed consent was obtained from head teachers of each school, acting in a position of loco-parentis, allowing pupils to be involved in the research. Before completing the online questionnaire, the participant information sheet (appendix B) was read aloud by a member of the research team to all class members, detailing the research aims and highlighting key ethical issues, such as the right to withdraw and how to do so, confidentiality and anonymity.

Participants were then able to provide their own informed consent by means of completing the questionnaire and submitting their response, as detailed in the information sheet. All participants were between the ages of 10 and 16 years old (mean age = 12.85, *SD* = 1.26), and 1.2% (N=8) of participants did not indicate their age. 42.9% (*N*=280) of the sample were male, 50.1% (*N*=327) were female, and 7% (*N*=46) did not indicate their gender. A more detailed summary of participant ages can be seen below in table 1, demonstrating that the majority of participants were aged between 12 and 14 years.

Table 1: Participant Age Frequency Data

Age (Years)	*N*	%
10	15	2.3
11	85	13
12	140	21.4
13	211	32.3
14	142	21.7
15	37	5.7
16	15	2.3
Age Not Indicated	8	1.2
Total	**653**	**100**

Materials

Due to the consistently successful use of self-report questionnaire data within previous bullying and cyberbullying literature, and the usefulness of such a method in obtaining a large quantity of empirical data, a questionnaire has been constructed to assess the present research hypotheses (Olweus, 2013). Data collection took the form of an online questionnaire (appendix C), comprising of several scales designed to measure the key constructs of online victimisation, resilience, social anxiety, and self-esteem. Additional demographic items were included to establish basic information, such as age and gender. Measures of friendship quality, perceived positive effects of peer-victimisation, and smartphone usage were also obtained, but not used in this analysis.

Cyberbullying

An overall measure of cyberbullying victimisation was obtained through the Self-Report Victimisation Scale (Boulton, Trueman & Murray, 2008), gathering participants' reports of online victimisation frequency, as well as physical victimisation, verbal victimisation, and social exclusion victimisation, all of which

can be analysed independently. Within this scale, online victimisation is assessed with a single frequency based item; 'how often in the last year has another child been mean to you in a text or online to make you feel bad', in which participants are required to indicate the frequency of such experiences in a Likert-style response format with the following four response options; 'never', 'not very often', 'sometimes', and 'lots of times', scored on a scale of one to four. Responses were coded in a way that a single score was obtained for each participant, with a higher score indicating a higher frequency of cyberbullying experiences, and a lower score indicating less frequent experience of cyberbullying. Reliability has previously been documented, deeming this measure suitable for use, as participants' self-report scores significantly correspond to the extent to which they consider themselves a victim or a bully during individual interviews, suggesting that the self-report measure captures children's accurate perceptions of bullying experiences (Boulton et al., 2008). However, reliability will need to be established within the present sample prior to analysis taking place.

Resilience

A measure of resilience was obtained with a concise version of the Connor-Davidson Resilience Scale (CD-RISC; Connor & Davidson, 2003). Participants were given 10 items, in which they were required to respond with the extent to which they agree or disagree with each statement, with the following five response options; 'not true at all', 'rarely true', 'sometimes true', 'true often', and 'true all the time', scored from zero to five respectively. Items were designed to establish individuals' resilience, adaptability, and ability to 'bounce back' after a negative event, and include statements such as, 'I am able to adapt to change', 'I am not

easily discouraged by failure', and 'coping with stress can strengthen me'. Participant scores for each item have been computed into a single average score from zero to five, with a high score indicating a high level of resilience, and a lower score indicating a lower level of resilience. The full scale has previously demonstrated good internal consistency above the acceptable level, with a Cronbach's alpha (α) of 0.89 (Connor & Davidson, 2003). Further, the internal consistency of the adapted 10 item scale has also been documented as good, with a Cronbach's α of 0.85, indicating reliability and suitable for use (Campbell-Sills & Stein, 2007). However, although suitability of the 10 item CD-RISC for use can be assumed, such reliability estimates are based on a university population, and reliability will need to be established across the present sample of children and adolescents.

Social Anxiety

Social Anxiety was assessed through the social concerns sub-scale of the Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1985). The sub-scale consists of seven items, in which participants are required to respond on a four point Likert scale of how true each statement is for them, ranging from, 'totally true for me', to 'not at all true for me', and scored between zero and three. Items include; 'I feel someone will tell me I do things the wrong way', and 'I feel alone even when people are with me'. Prior to analysis, all items have been reverse coded so that a high score indicates a high level of anxiety and a low score indicates a low level of anxiety surrounding social concerns. The scores from each item within the scale were then computed into a single average score for each participant, representing their level of social anxiety. The RCMAS

has previously established psychometric quality, with all sub-sections, including social concerns demonstrating an acceptable level of internal consistency (Varela & Biggs, 2006). However, as only one sub-section of the scale is being used, and reliability is dependent upon the specific sample, this again requires confirmation (Varela & Biggs, 2006).

State Self-Esteem

A measure of state self-esteem was obtained by a six-item assessment of individual perceptions of self-worth in the current moment (Thomaes et al., 2010). Items were both positively and negatively worded to avoid response set bias, and included statements such as, 'I am proud of myself right now', and 'I am disappointed in myself right now'. Again, participants were required to respond on a four point Likert scale, indicating how often they feel this way, ranging from 'never' to 'lots of times', and scored between zero and three. The negatively worded items were then reverse coded so that a high score indicates a high level of state self-esteem, and a low score indicates a low level of state self-esteem. Again, scores across the full scale were collapsed to form a single score of state self-esteem for each participant. Previous analysis has reported Cronbach's α of 0.8, indicating a good level of internal consistency, and suggesting that the six item measure of state self-esteem is reliable and suitable for use among children (Thomaes et al., 2010).

Procedure

The above measures were collated to form an online questionnaire in the software 'Bristol Online Surveys', which was published online and a unique URL webpage link was stabilised for participants to access when required. Once ethical approval

had been obtained from the University of Chester Department of Psychology Ethics Committee (appendix A), initial contact was made with local schools via email, detailing the aims and objectives of the research and requesting permission for student participation.

Upon gaining access to the required number of schools, classrooms were visited to recruit students in their everyday school environment in order to limit disruption to the school day. The classrooms all contained enough computers for each participant to access a computer with internet connectivity in order to complete the questionnaire independently and ensure confidentiality. Firstly, the participant information sheet (appendix B) was read aloud, informing participants of their right to withdraw from the study at any time, by simply closing the browser, and emphasising the anonymity of any data that they may provide. Participants were also directed to several sources of support, should they experience any distress as a result of the questionnaire. Participants were then directed to the questionnaire webpage via the unique URL and instructed to follow the on-screen directions. At this point, the information sheet was presented on-screen to all participants, giving them the opportunity to re-read any of the information themselves.

After completing the questionnaire, participants were presented with a debrief screen, thanking them for taking part and again detailing sources of support. After data collection had taken place, between June and July 2017, data from the online questionnaire was extracted and collated in an SPSS data file for analysis to take place, with all data remaining securely stored in a password protected domain at all times.

Design and Analysis

A cross-sectional survey design has been utilised to gather a large amount of quantitative data for analysis in relation to the present research hypotheses. Analysis has taken the form of correlation, simple and hierarchical multiple regression, and *t*-tests. Prior to any inferential analysis being conducted, preliminary analysis was carried out to confirm the suitability of the data for the intended analytic techniques, and eliminate any potential outliers within the data. The data was also assessed for multicollinearity, in order to limit the potential influence of independent variables that are too highly correlated with one another. Multicollinearity is a common issue within this field, as concepts often overlap theoretically, which can be severely problematic in the interpretation of results, and should therefore not be included within the same regression model (Marsh, Dowson, Peitsch & Walker, 2004; Morrow-Howell, 1994). Although debate exists surrounding the recommendations in relation to multicollinearity, a correlation coefficient of 0.7 is typically referred to as the recommended maximum within behavioural research (Pallant, 2013).

Estimates of internal consistency have also been obtained for all of the measures used to ensure reliability of the data. A Cronbach's alpha (α) coefficient has been obtained for each measure, excluding the measure of cyberbullying. This used only a single-item, therefore limiting the ability to correlate participants responses to any other items designed to assess the same construct. The acceptable *α* level criterion of 0.7 (Pallant, 2013) has been used to ensure a consistent approach across all measures, with Cronbach's α levels above 0.8 being classified as

demonstrating 'good' internal consistency, and those above 0.9 demonstrating 'high' internal consistency.

To address hypothesis one, that online victimisation, self-esteem and resilience will predict social anxiety a standard multiple regression was conducted with online victimisation, self-esteem and resilience entered as independent (predictor) variables, and social anxiety entered as the dependent (outcome) variable. The regression model was then evaluated to determine whether or not the independent variables could collectively predict social anxiety. Using the significance level of the ANOVA output table, along with the R square value, the amount of variance in social anxiety that can be explained by the predictors collectively was determined. The standardised Beta (β) coefficients and their significance values were also evaluated to determine whether each predictor variable can uniquely predict the outcome variable, with the greatest β coefficient suggesting the greatest unique contribution to the outcome variable.

In order to determine the amount of unique variance explained by each individual predictor variable, hierarchical multiple regression was then conducted, using three models to isolate each variable of interest. The first model included social anxiety as the dependent variable, with self-esteem and resilience entered into block one and online victimisation in block two as the variable of initial interest. In the following model, online victimisation and self-esteem were entered into block one, with resilience in block two. Finally, online victimisation and resilience were entered into block one, with self-esteem in block two. The predictor variables were assessed in this particular order based upon the specific research question, and the expected order of importance. Unique variance of each predictor was identified

through the model summary R square change value when both other variables had been controlled for.

The same process was completed to address hypothesis two, that social anxiety, self-esteem and resilience will predict online-victimisation, with standard multiple regression followed by hierarchical multiple regression. The first model included social anxiety, self-esteem and resilience as predictor variables, and online victimisation as the outcome variable to establish the collective predictive power of the three independent variables. Following this, three hierarchical multiple regression models were used to establish the unique prediction of each variable, and the amount of unique variance explained.

To address the third hypothesis, that there would be gender differences in levels of social anxiety, self-esteem, resilience and the amount of online victimisation experienced, four independent-samples t-tests were conducted. The first t-test examined the gender difference in self-esteem, comparing the mean state self-esteem scores for males and females. The second t-test considered gender differences in instances of online victimisation reported, comparing mean scores of male and female participants. Finally, a t-test was conducted to assess the difference in mean resilience scores between males and females.

Results

Reliability Analysis

In order to confirm the suitability of the measures used within the present study, a measure of internal consistency in the form of a Cronbach's α coefficient has been obtained for all scales, excluding the cyberbullying measure. As all measures appear to demonstrate a good level of internal consistency, exceeding the recommended criterion of 0.7, reliability can be inferred, and they may be assumed fit for purpose in this particular study and sample population. These measures can also be recommended for use in future research in the move towards a consistent and reliable method that has been requested within the bullying literature (Menesini & Salmivalli, 2017).

Table 2: Cronbach's α reliability statistics

Measure	**Cronbach's Alpha (α)**
State Self-Esteem	0.87
Resilience	0.88
Social Anxiety	0.85

Descriptive Statistics

The descriptive statistics presented in table three, below demonstrate the average scores for each variable across the sample, along with the standard deviation from this value. As can be observed in the table, on average, frequency of cyberbullying was relatively low, along with the average social anxiety score. Average state self-

esteem appears relatively mid-range, however, and average level of resilience can be considered mid-range to high amongst the present sample.

Table 3: Descriptive Statistics (Means & Standard Deviations)

	Mean	**Standard Deviation**	***N***
Social Anxiety	1.178	0.719	596
Resilience	2.259	0.815	577
Self-Esteem	1.968	0.719	617
Cyberbullying	0.75	0.952	644

Preliminary Analysis

Prior to conducting statistical analysis, data has been checked against the assumptions of multiple regression, confirming the suitability of such tests. All variables to be included in the regression models were assessed for multicollinearity, firstly through the bivariate correlations of each variable with one another. Recommendations suggest that all variables should significantly correlate with the dependent variable with a correlation coefficient of 0.3 or above, and the correlation between each of the variables should not exceed 0.7 (Pallant, 2013). As demonstrated in the table below (table 4), all variables significantly correlate with one another, with correlations between each predictor variable and the dependent variable(s) exceeding 0.3, when correct to one decimal place, and the correlations between each variable falls below the recommended 0.7 criterion (Pallant, 2013). Thus, multicollinearity does not appear to be an issue and all variables can be retained and included in subsequent analysis.

Table 4: Preliminary Analysis - Variable Correlations

	Social Anxiety	Cyberbullying	Resilience	Self-Esteem
Social Anxiety		0.412*	-0.525*	-0.598*
Cyberbullying			-0.272*	-0.377*
Resilience				0.467*
Self-Esteem				

*Significant at 0.001 level.

Due to the sensitivity of multiple regression to outliers, data has also been assessed for the presence of any extreme high or low scores that may skew the results. During this analysis, a Normal Probability Plot (P-P) of the Regression Standardised Residual and Scatterplot were requested. Figure one below shows the Normal Probability plot, implying no clear deviations form normality in the data as the points show a relatively straight line, as per recommendations (Pallant, 2013). Figure two, the scatterplot of data scores also suggests the absence of any outliers, with the majority of scores falling along the 0 point, with no cases demonstrating a standardised residual above 3.3 or below -3.3 (Pallant, 2013). Therefore, no further action is required in terms of eliminating outliers, and it can be assumed that data is suitable for analysis using multiple regression techniques.

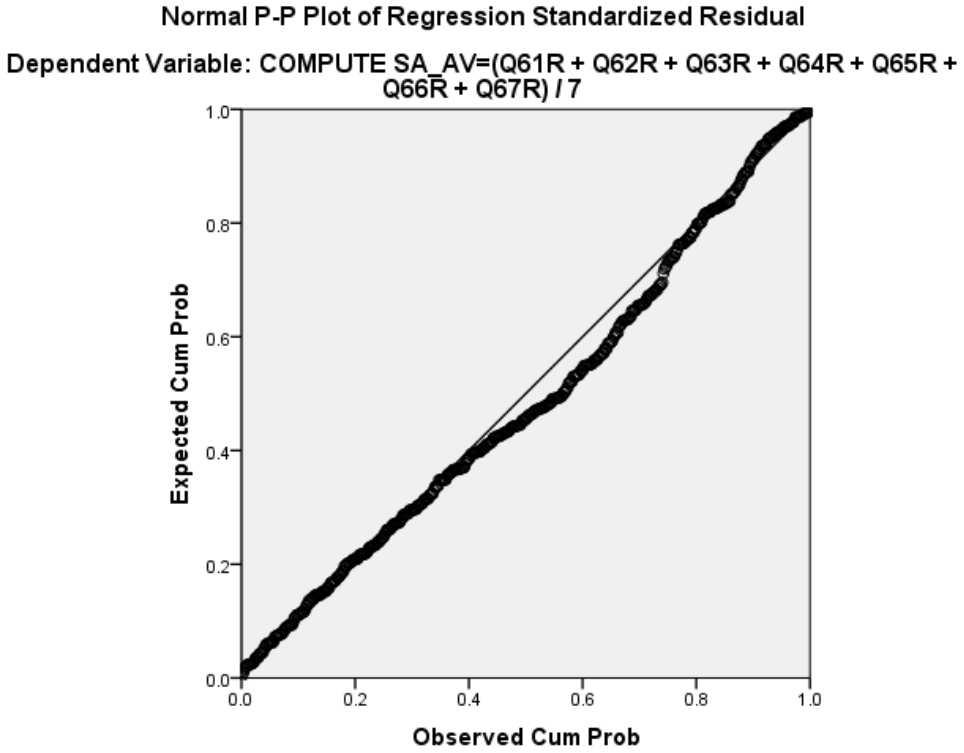

Figure 1: Normal P-P Plot of Regression Standardised Residual

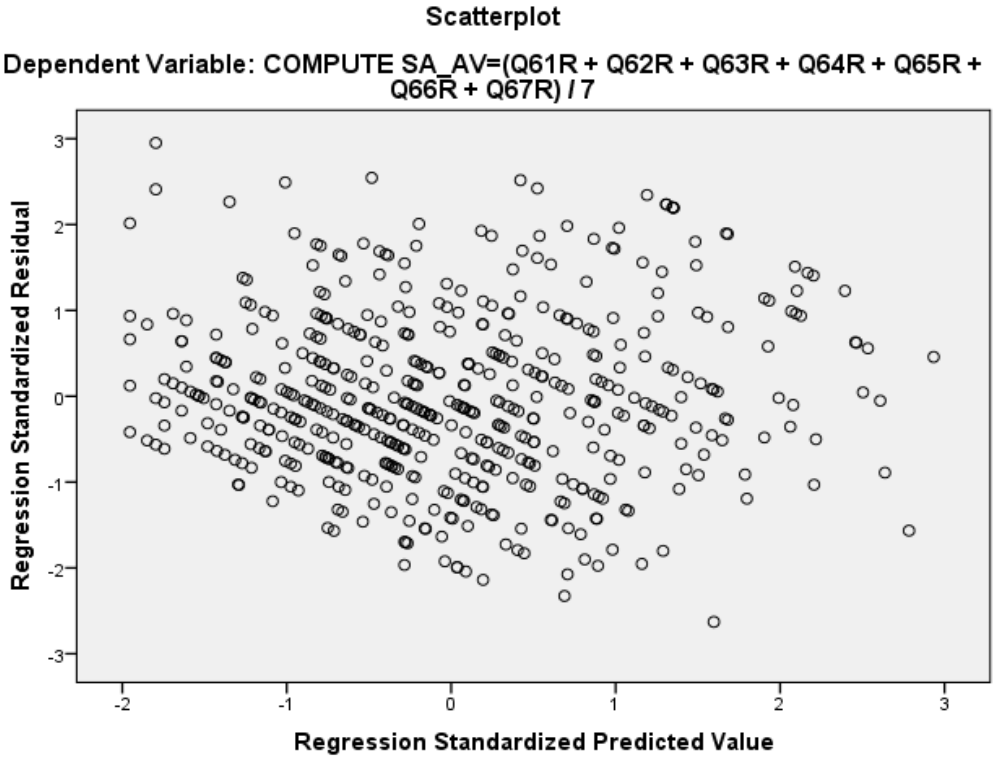

Figure 2: Scatterplot

Hypothesis One

Standard Multiple Regression

In response to hypothesis one that cyberbullying, self-esteem and resilience will collectively predict social anxiety, a standard multiple regression was conducted, with cyberbullying, self-esteem and resilience entered as predictors into a standard multiple regression model. A significant model emerged, explaining 46.4% (R^2 = .464) of the variance in social anxiety: F (3,544) = 156.749, p<0.001, suggesting that the three independent variables can collectively account for a significant amount of the variance in social anxiety. As shown in the table of standardised Beta (β) coefficients below, cyberbullying, self-esteem and resilience, all also emerged as significant unique predictors of social anxiety, indicating that self-esteem appears to make the greatest unique contribution to social anxiety, considering the higher β value, followed by resilience, and finally, cyberbullying.

Table 5: Standardised Coefficients & Significance Levels - Hypothesis One

	β	***p***
Cyberbullying	.185	<.001
Resilience	-.291	<.001
Self-esteem	-.393	<.001

Hierarchical Multiple Regression

Upon establishing the collective predictive power of the initial regression model, and the indication that the three independent variables can uniquely predict social anxiety, the subsequent analysis intended to determine the amount of unique variance accounted for by each of the independent variables. In order to establish

the amount of unique variance that can be accounted for by each of the predictors, a hierarchical multiple regression was conducted. Three models were used, with each predictor variable entered into block two separately, with the other two independent variables controlled for to identify the unique contribution of each predictor.

Hypothesis 1a

The first model, in response to hypothesis 1a included self-esteem and resilience in block one as the control variables, explaining 43.5% of the variance in social anxiety. After entering cyberbullying at step two, the model explained 46.4% of the total variance, as anticipated by the previous standard multiple regression model (F (3,544) = 156.749, p<0.001). Cyberbullying alone uniquely accounted for 2.9% of the variance in social anxiety, after self-esteem and resilience were controlled for; R squared change = 0.029, F change (1,544) = 29.236, p<0.001.

Hypothesis 1b

In the second model for hypothesis 1b, cyberbullying and self-esteem were entered at step one, accounting for 39.8% of the variance in social anxiety. When resilience was then added at step two, the total variance explained by the model was again 46.4%, with resilience uniquely accounting for 6.5% of the variance in social anxiety demonstrating a slightly greater unique contribution than cyberbullying, R squared change = 0.065, F change (1,544) = 66.392, p<0.001.

Hypothesis 1c

A third model was evaluated in response to hypothesis 1c, with resilience and cyberbullying entered at step one, collectively accounting for 35.4% of the variance

in social anxiety, and self-esteem entered at step two. After entering self-esteem at step two, the total variance explained by the model was again 46.4%, with self-esteem making a unique contribution of 11%, accounting for the greatest unique variance in social anxiety of the three predictor variables, *R* squared change = 0.110. *F* change (1,544) = 111.657, $p<0.001$.

Hypothesis Two

Standard Multiple Regression

In response to the second hypothesis, that social anxiety, self-esteem and resilience will predict cyberbullying, further standard multiple regression analysis was conducted. Initially, cyberbullying, self-esteem and resilience were entered into the model as predictors simultaneously, in order to identify their collective contribution to the variance in online victimisation. A significant model emerged, explaining 19.7% ($R^2 = 0.197$) of the variance in online victimisation: *F* (3,544) = 44.572, $p<0.001$, demonstrating the collective influence of all three variables on online victimisation. As demonstrated in the table below, both online social anxiety and self-esteem made a significant unique contribution to online victimisation, with the *β* values suggesting that social anxiety makes a greater unique contribution than self-esteem. However, resilience does not appear to make a significant unique contribution to the variance in online victimisation.

Table 6: Standardised coefficients and significance values – Hypothesis Two

	B	***p***
Social Anxiety	0.276	<0.001
Self-esteem	-0.196	<0.001
Resilience	-0.036	0.441

Hierarchical Multiple Regression

As social anxiety and self-esteem appeared to significantly account for unique variance in online victimisation, a hierarchical multiple regression was conducted in order to assess the amount of unique variance explained by each. Two models were used, with each variable being controlled for at a time.

Hypothesis 2a

In the first model, in response to hypothesis 2a, self-esteem was entered at step one to be controlled, and after entry of social anxiety at step two, the total variance explained by the model was 19.6% (R^2 = 0.196): F (2,567) = 69.3, p<0.001. The variable of interest, social anxiety, explained an additional 5.4% of the variance in online victimisation after self-esteem was controlled for, R squared change = 0.054, F change (1, 567) = 38.088, p<0.001.

Hypothesis 2b

In the second model, social anxiety was entered at step one, and self-esteem was added at step two. The total model again explained 19.6% (R^2 =0.196) of the variance in online victimisation, F (2,567) = 69.3, p<0.001, with self-esteem

uniquely accounting for 2.7% of the variance: *R* squared change = 0.027, *F* change (1,567) = 18.863, $p<0.001$.

Hypothesis 2c

In response to the hypothesis that resilience will uniquely predict cyberbullying, resilience did not emerge as a significant unique predictor during standard multiple regression, and therefore no further analysis was conducted.

Hypothesis Three

As previous research has indicated several potential gender differences in the variables of interest, these have been assessed through the use of *t*-tests to determine the extent of any potential differences. It has been predicted that during adolescence, boys may report higher self-esteem than girls. As demonstrated in the table below, an independent-samples *t*-test revealed that on average, males had higher state self-esteem than females, indicating a substantial gender difference in state self-esteem scores of the sample population and supporting the prediction that adolescent girls will demonstrate lower self-esteem than boys. A further *t*-test was conducted to assess any potential gender differences in online victimisation, as the literature suggests that relational bullying may be more prevalent among girls than boys.

Analysis revealed that on average, females reported more frequent instances of online victimisation than males. This difference was significant, suggesting that females within the sample population experience more instances of online victimisation than their male peers, as was predicted on the basis of previous findings. In terms of resilience, males demonstrated slightly higher resilience than

females. This difference was also significant, indicating a gender difference in resilience scores amongst the sample population. As social anxiety disorders are typically more prevalent among females than males, it was predicted that signs of social anxiety will be more prevalent in girls than boys within the present sample. An independent samples *t*-test was again conducted, revealing no significant difference in social anxiety scores for males and females.

Table 7: Summary of results for *t*-tests of gender differences in social anxiety, online victimisation, self-esteem and resilience.

Variable	Males			Females			95% CI for Mean Difference	*t*	df
	M	SD	*N*	M	SD	*N*			
Social Anxiety	1.11	0.63	248	1.15	0.74	309	-0.15, 0.07	-0.67	553
Cyberbullying	0.54	0.8	278	0.88	1.01	322	-0.49, -0.2	-4.56*	598
Self-Esteem	2.16	0.64	264	1.86	0.7	312	0.19, 0.41	5.31*	574
Resilience	2.43	0.84	235	2.15	0.74	300	0.15, 0.41	4.12*	533

*Significant at $p<0.001$

Discussion

The primary aim of the present study was to expand the existing understand of the relatively new phenomenon of cyberbullying, and how it relates to several key correlates of traditional bullying; social anxiety, self-esteem and resilience. Along with assessing the degree to which associations exist between such factors, the study also intended to establish the nature of any associations, to work towards a more functional explanation of cyberbullying and possible outcomes. Based upon the existing literature surrounding both traditional bullying and cyberbullying, several key hypotheses were explored. Hypothesis one predicted that cyberbullying, self-esteem and resilience would collectively predict social anxiety, with hypotheses 1a, 1b and 1c predicting that each would make a significant unique prediction.

Hypothesis two predicted that social anxiety, self-esteem and resilience would collectively predict cyberbullying, along with hypotheses 2a, 2b, and 2c predicting that each would account for unique variance in cyberbullying. Hypothesis three predicted that there would be gender differences in cyberbullying, social anxiety, self-esteem and resilience. Hypothesis 3a predicted that girls would report a greater frequency of cyberbullying than boys, hypothesis 3b predicted that girls would report lower self-esteem, and hypothesis 3c predicted that girls would report lower resilience than boys. As the existing literature surrounding gender differences in social anxiety is mixed, hypothesis 3d made a non-directional prediction that there would be a gender difference in reports of social anxiety between boys and girls. All hypotheses were assessed through a cross-sectional design, based on a representative sample of 653 U.K school children aged 10-16, with analysis conducted in the form of correlation, standard multiple regression, hierarchical multiple regression, and *t*-tests.

In relation to hypothesis one, cyberbullying, self-esteem and resilience were found to significantly predict social anxiety, both collectively and uniquely, reflecting the existing literature and leading to the acceptance of this hypothesis. As was expected, the finding that cyberbullying uniquely predicts social anxiety supports existing literature and the idea that cyberbullying increases the risk of social anxiety among adolescents (Dempsey et al., 2009; Nansel et al., 2001; Reijntjes et al., 2010). However, the small effect size suggests that this relationship may not be as strong as is often assumed, suggesting that other factors are likely involved and the relationship is more complex. This small effect size also reflects the recent claims of Olweus (2017) that the severity and prevalence of cyberbullying is somewhat exaggerated, within the media and within academic literature. This also reflects the idea that cyberbullying may be an extension of traditional bullying, rather than an entirely unique construct. However, further research is required to understand the unique role of cyberbullying in comparison to traditional bullying.

The findings of hypothesis 1b and 1c, demonstrating a negative relationship between social anxiety and self-esteem, and social anxiety and resilience also support the existing literature, and the idea that increased self-esteem and resilience are uniquely linked to lower levels of social anxiety. These findings also begin to reflect the idea that self-esteem and resilience act as protective factors against social anxiety, as greater self-esteem and resilience predicted lower social anxiety. The difference in effect size also indicates that self-esteem may play a more specific role than general resilience, as the effect size of self-esteem is larger, reflecting the crucial role of self-esteem in both social anxiety and resilience.

The second hypothesis, that social anxiety, self-esteem and resilience would collectively predict cyberbullying has also been accepted. Additionally, both hypothesis 2a and 2b were accepted, as both social anxiety and self-esteem emerged as significant unique predictors of cyberbullying. However, hypothesis 2c, that resilience would uniquely predict cyberbullying was not supported, as resilience did not appear to make a significant unique contribution. The finding that social anxiety significantly predicts cyberbullying provides support for the idea that the typical 'outcomes' of bullying may also increase vulnerability to bullying, supporting this growing body of literature. However, generalisations to other age groups regarding the role of self-esteem in bullying should be considered with caution, due to the likelihood that self-esteem and self-perceptions vary during adolescence compared to other stages in the lifespan (Troop-Gordon & Ladd, 2005). For example, evidence suggests that self-perceptions typically become more positive and perceptions of peers become more negative during adolescence, which is likely to influence responses in this age group (Troop-Gordon & Ladd, 2005).

Nevertheless, taken together, the findings of both hypothesis one and two begin to support the idea of a reciprocal relationship between cyberbullying and social anxiety, as cyberbullying uniquely predicted social anxiety, whilst social anxiety also uniquely predicted cyberbullying. These findings reflect the transactional model of development, which implies that an individuals' behaviour, cognition and environment are likely to determine one another in multiple directions, rather than in a unidimensional manner (Sameroff, 2009). The findings regarding social anxiety can therefore be viewed as evidence for a transactional relationship between cyberbullying and social anxiety, as the relationship appeared reciprocal in nature. Thus, whilst social anxiety may develop in response to a traumatic or stressful event, such as being bullied, it may also develop

gradually over time, influencing personality, behaviour and vulnerability to bullying. However, due to the cross-sectional nature of the present study, further research should be conducted to imply causation.

In terms of hypothesis three, the expected gender differences were revealed in cyberbullying, self-esteem and resilience, leading hypotheses 3a, 3b and 3c to be accepted. However, no significant gender difference was identified in relation to social anxiety, failing to support the previous claims that social anxiety is more common amongst girls than boys. This discrepancy with some of the existing literature may be reflective of the self-report method of data collection, in that girls are often more likely to seek support and diagnosis of anxiety related concerns, therefore implying a gender difference, and thus, the use of anonymous self-report data enabled an accurate portrayal of boys social anxiety levels, that may often be underreported. However, as the findings are consistent with the literature that reports no gender difference in social anxiety, this would require further research, possibly using an alternative method to self-report data collection. It may also be the case that whilst there is not gender difference in the prevalence of social anxiety disorder, there may be differences in coping mechanisms, with findings in the adult population suggesting that women are more likely to seek pharmacological treatment whereas men are more likely to use alcohol to relieve symptoms (Xu et al., 2012).

Whilst it was indicated that the frequency of online victimisation was greater among girls than boys within the present sample, supporting the proposal that girls experience more relational bullying than boys, the observed difference may reflect some degree of reporting bias. Research has suggested that girls are more likely to report instances of bullying than boys, possibly due to social desirability (Unnever & Cornell, 2004). Thus,

it is possible that girls were more likely to admit to being bullied than boys, influencing the gender difference that has been observed. Additionally, instances of bullying are often under-reported in general, which may have significant implications within the research literature, and may explain the diverse range of prevalence rates reported. Willingness to report bullying has previously been discussed in relation to a rational choice framework, in which victims make the decision to seek help based on a cost-benefit appraisal, with the benefits of reporting bullying including increased support and protection, and the potential costs typically surrounding embarrassment or fear of retaliation (DeLara, 2012; Schneider et al., 2015; Unnever & Cornell, 2004). However, as participants were repeatedly ensured of the confidentiality of their data, and reminded what any information will be used for likely encouraged accurate responses. More recently, factors such as younger age, lower socioeconomic status and being Caucasian have been found to predict increased likelihood of help-seeking in instances of bullying, suggesting that the decision to report bullying may be complex, and influenced by broader factors beyond the control of researchers (Bauman, Meter, Dixon & Davis, 2016).

Practical and Theoretical Implications

Research of this kind not only informs the literature, providing support to existing theories and ideas, but can also inform interventions to reduce the impacts of bullying and cyberbullying within applied settings. In terms of the theoretical implications, the findings provide clear support for the postulates of the need to belong theory, proposed by Baumeister and Leary (1995). The theory suggests that failure to achieve a sense of belonging can lead to severe psychological maladjustment, which is reflected in the finding that more frequent experience of cyberbullying can predict social anxiety. This

particular finding therefore supports the need to belong theory as those who are bullied are less likely to achieve a sense of belonging within the peer group, and would therefore be at risk of psychological maladjustment, such as anxiety or depression, according to the theory. Additionally, as the present findings are representative of a U.K. adolescent population, it can be suggested that the need to belong theory is likely to apply specifically to this population, expanding the theoretical concept.

The findings of the present study also have clear theoretical implications for the idea of a transactional model of development, with the findings suggesting a potentially reciprocal relationship between cyberbullying and social anxiety. As both variables were found to significantly and uniquely predict one another, a transactional model is useful in understanding this relationship, as it appears much more complex than a simple unidimensional relationship. Throughout the bullying literature, it has become increasingly apparent that such associations are not linear, and are likely to involve multiple complex dimensions. Thus, by gaining support for the idea of a transactional model, the potential to understand the complex constructs associated with bullying, and more specifically, cyberbullying is clear, based on specific theoretical concepts.

Aside from the theoretical implications, the present findings demonstrate considerable practical implications, which may be suitable in informing both policy and practice surrounding bullying. For example, as both social anxiety and self-esteem were found to uniquely predict the frequency of cyberbullying, it may be possible for schools, parents or practitioners to identify children and adolescents at increased risk of bullying or cyberbullying due to their lower self-esteem or greater social anxiety. In doing so, preventative interventions may enable ‘at risk’ individuals to build their social skills and self-esteem at an early stage to reduce the potential risk of adverse outcomes. As well

as having the potential to reduce the risk of becoming a victim of cyberbullying, preventative self-esteem building interventions are also likely to reduce the risk of other adverse outcomes in adolescence, such as depression or eating disorders. For example, a study of 297 adolescents identified as at risk for eating disorders revealed that a school-based prevention program focused on increasing self-esteem reduced body dissatisfaction, significantly reducing participants' level of risk (Niide, Davis, Tse & Harrigan, 2013). However, this may present considerable challenges, as those with low self-esteem are often less receptive to intervention or support, but are likely to respond better when their negative beliefs are validated by others (Marigold, Cavallo, Holmes & Wood, 2014). Thus, it is crucial to ensure that support and interventions consider the specific preferences of each individual, and do not attempt to apply the same intervention universally to all children and adolescents (Marigold et al., 2014).

Early anti-bullying interventions have also shown clear success in reducing school bullying, although it is crucial that such interventions remain up-to-date and relevant to the ever-changing climate of bullying behaviours, particularly given rapidly developing nature of cyberbullying (Smith & Shu, 2000). Considering the present finding that self-esteem and resilience uniquely predict cyberbullying, the idea of utilising school interventions to foster resilience and self-esteem may have useful impact on the frequency of cyberbullying. For example, several findings have suggested that fostering resiliency in school children through school-based programs can significantly improve coping for youth exposed to ongoing or frequent trauma (Baum, 2005; Stoker, Baum, Plischke & Ziv, 2014). Meta-analytic findings based upon 213 social and emotional learning programs also demonstrates the significant contribution that such programs can have on the healthy development of children and adolescents, improving social and emotional skills (Durlak, Weissberg, Dymnicki, Taylor & Schellinger, 2011). It has

also been suggested that rather than focusing intervention on directly reducing bullying, or increasing self-esteem, interventions that aim to foster a 'potential for change' mindset enable adolescent students to build resiliency in preparation for future adversity (Yeager & Dweck, 2012). However, in a minority of cases, teachers' involvement in bullying may be more detrimental than beneficial, highlighting the need for adequate training and a flexible approach (Smith & Shu, 2000).

Whilst the idea that most adult mental health conditions begin during adolescence is well documented, at present there is a lack of published research regarding building adolescent resilience as a prevention approach (Banos et al., 2017). However, preliminary research has demonstrated success in the use of ICT based intervention to build resilience in adolescents, although further longitudinal research has been recommended (Banos et al., 2017). Findings also suggest that a greater sense of school connectedness and belonging can significantly predict a decrease in both bullying perpetration and victimisation, with sense of belonging showing a direct contribution to increased resilience (Scarf et al., 2016; Turner et al., 2014). Such ideas again reflect the postulates of need to belong theory, and the idea that the association between bullying and maladaptive outcomes may be due to a decreased sense of belonging. Similarly, increased sense of connectedness has also been found to serve as a protective factor against the negative outcomes of adolescent victimisation, along with parental engagement (Morin, bradshaw & Berg, 2015). Interventions designed to increase adolescents' sense of belonging have also been found to contribute to increases in resilience, suggesting that peer group interventions that promote group affiliation and team work may be useful in building resilience (Scarf et al., 2016). Thus, intervention focused on increasing individuals' sense of belonging and group connectedness may prove beneficial both in decreasing instances of bullying and in

buffering the potential negative outcomes in victims (Morin et al., 2015; Turner et al., 2014).

However, due to the majority of online victimisation taking place away from school and the ever-growing accessibility of the internet, instant messaging and social media, the extent to which school connectedness may have a benefit is unclear. School staff should however, maintain a clear awareness of students' experiences of cyberbullying, and continue to monitor the prevalence and attitudes towards cyberbullying, through open and honest dialogue with students, parents and practitioners (Beale & Hall, 2007). Students themselves should also be educated surrounding the and how to deal with cyberbullying, and more specifically around the idea that online interactions may be ambiguous and easily misconstrued. Additionally, both parents and teachers should build basic awareness of modern technologies, particularly newly emerging social networking platforms that enable instant and widespread communication (Olweus, 2013). However, Olweus (2013) warns against a shift in anti-bullying policy from traditional bullying towards cyberbullying, considering the high degree of overlap between the two forms. Thus, whilst an increased awareness of cyberbullying is required, it is crucial to maintain a focus on traditional bullying within schools, as this is likely where victimisation begins, before moving to the online domain. Nevertheless, cyberbullying appears to have severe consequences, and should not be trivialised or dismissed, especially during the complex and important years of adolescence.

It has also been argued that perpetrators of bullying have lower self-esteem, which may be of importance to those involved in bullying intervention (Fanti & Henrich, 2014; Patchin & Hinduja, 2010). For example, the compensation model of aggression states that bullying is an individual's reactive response to their own low self-esteem and

perceived weakness, to which they 'compensate' by targeting more vulnerable individuals, although this has been considered as too simplistic an explanation (Simon et al., 2017). Additionally, this relationship is a lot less consistent and prominent than that of victimisation and lower self-esteem, with mixed evidence and low effect sizes (Cook et al., 2015; Patchin & Hinduja, 2010; Simon et al., 2017). For example, a recent meta-analysis of 121 studies revealed a negative association between bullying perpetration and self-esteem that was considered trivial, with a small effect size of r=-0.07 (Tsaousis, 2016). Thus, it is likely that low self-esteem contributes to bullying perpetration in a more complex way, with a combination of personality factors increasing the likelihood of an individual to bully others rather than low self-esteem alone (Simon et al., 2017). Thus, future research should also consider the relationship between self-esteem, social anxiety and bullying perpetration, as there is likely some degree of overlap in those who are victimised and those who bully others.

Limitations

Whilst there are many strengths to the present research, it is crucial to acknowledge any limitations. In terms of data collection, the use of self-report data in bullying research has previously been criticised, due to the possibility of victims to not recognise themselves as such, or choosing not to acknowledge their experiences due to social desirability or fear of potential consequences (Hymel & Swearer, 2015; Juvonen et al., 2013). Thus, it is possible that participants may not have responded accurately in terms of the extent to which they have or have not been cyberbullied, particularly as some degree of cyberbullying is often considered as 'banter' between friends. Research also suggests that those with high social anxiety are at greater risk of social desirability bias in their responses to socially sensitive topics due to their

increased concerns surrounding self-presentation and the desire to appear in a certain way (Van de Mortel, 2008). Therefore, considering the sensitive topics covered within the present study, such as social anxiety, self-esteem and cyberbullying, it is possible that those who are more socially anxious responded in a socially desirable way, which may have influenced the findings.

Several studies report the use of peer-nomination methods to enable more accurate data collection, although there is also an increased influence of observer bias and stereotyping, with highly complex and inconsistent methods of 'cut-off' often being used to classify participants as bullies or victims, with significant limitations for replication (Juvonen et al., 2013; Solberg & Olweus, 2003). However, findings based on a combination of self, peer, and teacher reports of bullying appear to be consistent with those relying solely on self-report data, supporting the use of self-report within the field (Juvonen et al., 2013). However, it is also worth considering the potential for exaggerated effect sizes due to shared method variance, as self-report questionnaires were used to measure each variable (Hawker & Boulton, 2000). It has also been argued that due to the clear complexities and multi-directional influence of bullying behaviour and outcomes, the use of one standardised approach may not be suitable, and various methodological approaches should be utilised to complement one another and reduce shared method variance (Hawker & Boulton, 2000; Hymel & Swearer, 2015). However, as response options and number of response options were varied between the measures of different variables, shared method variance is likely minimal. Additionally, due to the clear and consistent reminders that all data is confidential and anonymous before, during and after data collection, it is possible to assume that most participants will have provided an honest and accurate account of their experiences.

As is the case with much of the existing research in this field, conclusions regarding causation cannot be drawn, due to the cross-sectional nature of the research design (Nansel et al., 2001). It may therefore be likely that additional factors may contribute to the associations observed. For example, it has been noted that whilst anxiety and self-esteem appear to be highly correlated to victimisation, this association decreases when depression is included in analysis, possibly due to the known co-morbidity of anxiety and depression (Axelson & Birmaher, 2001; Hawker & Boulton, 2000). Thus, the observed relationship between online victimisation, self-esteem and social anxiety in this case may be subject to variability should additional factors be assessed, particularly those that are often highly co-morbid. Additionally, it may be necessary to explore specific factors that increase adolescents' resilience to negative outcomes, such as parental support. Resilience should also be considered as a range of complex processes, as opposed to an individual personality characteristic, as children and adolescents are likely to show resilience to some events more than others, and may show resistance to some adverse outcomes, but not others (Rutter, 1999).

There has also been some debate surrounding the use of single-item measures of factors such as cyberbullying, as it is unclear whether this is sufficient in reflecting the entire experience (McCuddy & Esbensen, 2016). The use of a single item also restricts the ability to provide a measure of internal consistency, and therefore determine the reliability of the measure. It has therefore been argued that the use of a more detailed scale may provide a more accurate representation of the entire cyberbullying experience, and demonstrate greater psychometric quality (McCuddy & Esbensen, 2016). A multi-item scale would also enable the specific mediums in which cyberbullying takes place, such as social media or instant messaging to be determined to gain a more detailed understanding. However, single-item measures have been

deemed suitable in previous cross-sectional studies of bullying, it is possible to obtain a reliability estimate through test-retest reliability, administering the single item measure to the same participants on multiple occasions (Boulton et al., 2010; Fisher, Matthews & Gibbons, 2016).

Much of the existing bullying research is limited to early adolescence or broad age ranges (Troop-Gordon, 2017). Thus, the present study intended to recruit a representative sample of adolescent participants, to assess the specific experience of cyberbullying in adolescence. However, recruitment of those in middle to late adolescence, around 15-16 years of age proved challenging due to the school commitments and examinations of this age group during the data collection period. The present sample consequently limits the application of the findings to adolescence as a whole, as the majority of participants were aged 12-14. Future research of this kind should therefore aim to recruit participants in later adolescence, possibly by visiting sixth form and college settings at a time where students have a slower workload to widen the generalisability of the findings to adolescents as a whole.

Suggestions for Future Research

Whilst the present study indicates the potential for a reciprocal relationship between cyberbullying and social anxiety, supporting a transactional model of development, it has been suggested that longitudinal studies are more valuable in understanding such complex relationships (Boulton et al., 2010; Sameroff, 2009). Thus, to further understanding the potential reciprocal relationships between cyberbullying and its' correlates, longitudinal work is recommended to build upon existing cross-sectional evidence of a transactional model (Boulton et al., 2010). Additionally, a more diverse range of factors should be explored, particularly those that are likely to contribute

towards increased resilience. In doing so, this will continue the move towards a clearer and more detailed understanding of the issues associated with cyberbullying, and how they may differ to traditional bullying. Research should also focus on the directions of the relationships between such variables, expanding the literature beyond its' current descriptive nature.

A consistent finding within the bullying literature that has not been discussed in the present study refers to the relationship between bullying victimisation and future perpetration, as those who have been bullied often become perpetrators themselves. As evidence suggests that these individuals, often referred to as bully-victims, are at the greatest risk of psychological malfunction in relation to bullying. Thus, future research should attempt to assess this relationship in relation to cyberbullying. By understanding the relationship between bullying victimisation and perpetration in relation to cyberbullying, this is likely to contribute to an increased understanding of factors that causally predict cyberbullying perpetration, with significant implications for prevention and intervention. Considering the risk associated with being both a victim and a perpetrator of bullying, it is likely that interventions should target perpetrators as well as victims, especially when attempting to build self-esteem and resilience, providing clear rationale for future study. Additionally, although resilience has become increasingly understood in terms of explaining complex behaviour, there has been a lack of focus on applying such knowledge to intervention (Ttofi et al., 2014). Thus, the present study adds to the current literature, providing rationale for incorporating resilience and self-esteem building into bullying interventions, due to the reported associations between such factors. It is therefore recommended that future research attempts to explore the impact and success of bullying intervention that intends to foster resilience.

Additionally, as the present study focused solely on the frequency of cyberbullying, it may be beneficial to consider other aspects of cyberbullying that may contribute to adverse psychosocial outcomes. For example, findings suggest that factors such as increased power differential and intentionality in bullying may often make a greater contribution to both anxiety and self-esteem than frequency, suggesting that measurement of the relationship based solely on frequency may not truly capture the cyberbullying experience (Malecki et al., 2016). However, these findings are based upon traditional bullying and may not generalise directly to cyberbullying, considering the differences in the nature of online communication. It has also been argued that in terms of measurement of cyberbullying, a distinction should be made between general victimisation and 'bullying' (Olweus, 2013). Victimisation and bullying are said to differ, with bullying being distinct due to the power differential criteria (Olweus, 2013). Findings suggest that making this distinction leads to considerable differences in effect size, with bullying yielding significantly greater impacts than general peer victimisation (Hunter, Boyle & Warden, 2007; Olweus, 20132). Thus, as the measure of cyberbullying in this case did not assess power differentials, it may be possible to gain a more accurate understanding of cyberbullying if such a distinction had been made. However, further empirical research is needed to understand this distinction, and to advance cyberbullying research and understand the processes underlying the associations between bullying and adverse outcomes (Olweus, 2013).

Finally, when testing for gender differences, it is assumed that the same construct or latent variable has been measured in both groups (Van der Sluis et al., 2016). Thus, it may also be useful to assess gender invariance, a form of measurement bias, within future research and confirm that the same theoretical construct is being assessed in both males and females, as gender variance is likely to render results invalid. When

comparing scores between genders, it may be possible that a construct, such as resilience, or in this case, cyberbullying has a different meaning for males and females, which is likely to influence responses and lead to gender variance. Assessing gender invariance is also likely to contribute towards a consistent and reliable methodological approach, which to date has been lacking within the bullying research. It may also be worthwhile to consider the use of multiple methods of data collection, collecting data in separate ways for predictor and outcome variables. In doing so, the issue of shared method variance will be substantially reduced, and measurement error will therefore be minimised. Thus, as the present study has demonstrated the suitability of several measures of cyberbullying and related factors, future research should continue to work towards a consistent method, with the intention of establishing a more replicable and reliable field of research.

Conclusion

Despite over 20 years of comprehensive empirical research surrounding the concept of bullying, and more recently, cyberbullying, there continues to be considerable discrepancies and gaps throughout the literature (Olweus, 2017). Thus, the present study sought to fill such gaps through the exploration of reciprocal nature of the relationship between cyberbullying and social anxiety, in relation to self-esteem and resilience. To conclude, the findings provide initial evidence to suggest a reciprocal relationship between cyberbullying and social anxiety, although future longitudinal research is required to further understand the complex relationship between such factors. Additionally, as the findings that self-esteem and resilience possess predictive power in both social anxiety and frequency of cyberbullying victimisation, there is clear justification for future intervention to incorporate self-esteem and resilience building techniques.

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